

CLAIMS

1. A method of producing polyalkylene terephthalate, which comprises: introducing a prepolymer of polyalkylene terephthalate that is in a molten state comprising 70 mol % or more of ethylene terephthalate or 1,4-butylene terephthalate repeating units and having an intrinsic viscosity $[\eta]$ between 0.2 and 2 dl/g through a feed opening into a polymerization reactor; discharging the introduced prepolymer through holes of a perforated plate; and then polymerizing the prepolymer under reduced pressure, while allowing the prepolymer to fall along the surface of a support that is open towards the outside at a temperature between the [crystalline melting point - 10°C] of the prepolymer or higher and the [crystalline melting point + 30°C] of the prepolymer or lower under the conditions represented by the following formula (1);

$$S_1/S_2 > 1 \quad (1)$$

wherein S_1 : the surface area of falling polyalkylene terephthalate, and

S_2 : the area where the support is in contact with polyalkylene terephthalate.

2. The method of producing polyalkylene terephthalate according to claim 1, wherein the prepolymer of polyalkylene terephthalate used in polymerization has an intrinsic viscosity $[\eta]$ between

0.4 and 2.0 dl/g and a carboxyl-terminal group concentration of the prepolymer of 150 meq/kg or less.

3. The method of producing polyalkylene terephthalate according to claim 1 or 2, which comprises introducing inert gas into a polymerization reactor by either the following step (A) or (B), or by both steps, and at the same time polymerizing the prepolymer of polyalkylene terephthalate under reduced pressure, while allowing the prepolymer to fall along the support;

(A) directly introducing the inert gas into the polymerization reactor that is under reduced pressure; and

(B) discharging under reduced pressure the prepolymer of polyalkylene terephthalate that has previously absorbed and/or contained the inert gas, so as to release the inert gas, thereby introducing it into the polymerization reactor.

4. A method of producing a molded article of polyalkylene terephthalate comprising 70 mol % or more of alkylene terephthalate repeating units, which comprises: introducing a prepolymer of polyalkylene terephthalate that is in a molten state into a polymerization reactor; polymerizing the prepolymer under reduced pressure, while allowing the prepolymer to fall along the surface of a support that is open towards the outside; and then transporting the prepolymer in molten state to a molding machine

followed by performing melt molding.

5. The method of producing a molded article of polyalkylene terephthalate according to claim 4, wherein the molded article of polyalkylene terephthalate is one or more selected from the group consisting of a preform for molding a hollow body, a hollow body, a film, a sheet, a fiber, and a pellet.

6. A molded article of polyalkylene terephthalate, which is produced by the method according to claim 4.

7. The molded article of polyalkylene terephthalate according to claim 6, wherein the molded article of polyalkylene terephthalate is one or more selected from the group consisting of a preform for molding a hollow body, a hollow body, a film, a sheet, a fiber, and a pellet.

8. Polyethylene terephthalate comprising 70 mol % or more of ethylene terephthalate repeating units, which has the following characteristics (C) to (F):

(C) an intrinsic viscosity $[\eta]$ ranging between 0.5 and 2.0 dl/g;

(D) a molecular weight distribution represented by M_w/M_n ranging between 1.8 and 2.2;

(E) an L-value and a b-value, which are obtained by measuring optical transmission of a solution prepared by dissolving the polyethylene terephthalate in HFIP at a concentration of 13% by

weight, ranging between 99 and 100, and between -0.5 and 0.5, respectively; and

(F) the content of acetaldehyde at 10 ppm or less.

9. The polyethylene terephthalate according to claim 8, wherein the amount of oligomers contained in the polyethylene terephthalate is within a range between 0.5 and 5.0% by weight.

10. A molded article of polyethylene terephthalate produced from the polyethylene terephthalate according to claim 8 or 9, which has a form selected from the group consisting of a preform for molding a hollow body, a hollow body, a film, a sheet, a fiber, and a pellet.

11. The molded article of polyethylene terephthalate according to claim 10, wherein said molded article of polyethylene terephthalate is a pellet, and the content of acetaldehyde in a molded article obtained by injection molding of the pellet at a molding temperature of 280°C is 15 ppm or less.